Practicing with the Euclidean Algorithm

(1) Use the Euclidean algorithm to find $\gcd(123, 321)$.

(2) Express $\gcd(123, 321)$ in the form $123x + 321y$, where x and y are integers.

(3) For each instance of Bézout's Identity, solve the equation in the integers or explain why there is no solution.

    (a) $123x + 321y = 30$

    (b) $123x + 321y = 31$